



Photo courtesy of VIMS.

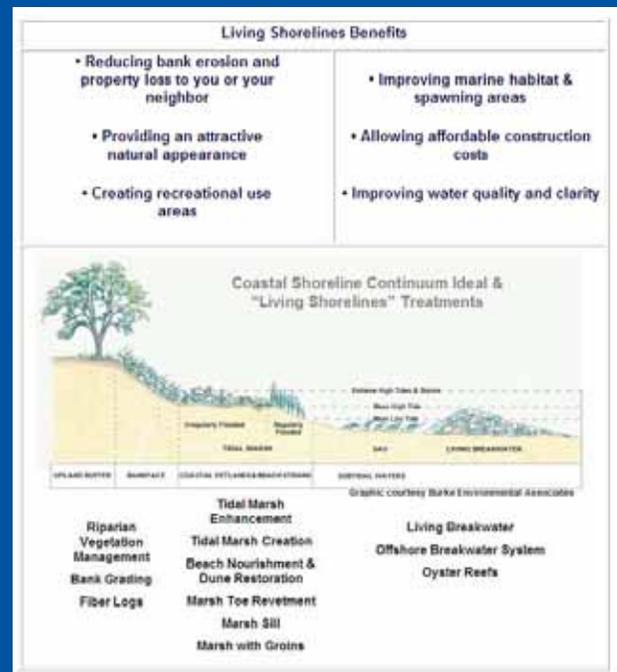
Shoreline erosion is a serious concern to waterfront landowners that want to protect their property, but installing structural barriers to protect land can also destroy important wetland, beach and dune habitats and disrupt important natural physical, geological and biological processes.

Virginia has come a long way in protecting its shorelines since the Wetlands Act of 1972 and the Coastal Primary Sand Dune Act of 1980 were adopted.

The emphasis is now “Living Shoreline” management techniques which provide a good alternative to traditional shoreline hardening. These techniques can prevent shoreline erosion while maintaining the benefits to wildlife and water quality that a natural shoreline provides.

“Living Shorelines” also may provide an opportunity for wetlands along the shoreline to migrate landward as sea level rises.

The Virginia Coastal Zone Management Program and the Chesapeake Bay National Estuarine Research Reserve, with CZMA funding, have worked together to promote this technique and to develop local shoreline management plans that show where living shorelines are most appropriate.



Graphic courtesy of VIMS.



*Portions of this accomplishments fact sheet (pages 1 & 4) were originally produced by the Virginia CZM Program for a June 2012 event to celebrate the 40th anniversary of the CZMA and to highlight the accomplishments made possible through this federal funding. This fact sheet was later expanded to include additional information about living shorelines.*

# Living Shorelines...

*Shoreline hardening is a growing trend, but a Natural Approach to Controlling Shoreline Erosion in taking root...*



*Erosion is a serious concern to waterfront landowners that want to protect their property, but installing structural barriers to protect land can also destroy important habitats and disrupt important natural physical, geological and biological processes.*



*In some creeks, more than half of the shoreline has been armored with shoreline protection structures. Photos above courtesy of VA CZM.*

**Living shorelines** (example in photo at right) may incorporate materials that include marsh plantings, shrubs and trees, low profile sills and breakwaters, strategically placed organic material, and other techniques that recreate the natural functions of a shoreline ecosystem.

Virginia has approximately 5000 miles of shoreline lined with marshes, beaches and tidal mudflats that provide a rich habitat for a wide variety of plants and animals. There is growing concern, however, that increasing “hardening” of the shoreline by installing rock revetments and wood or vinyl bulkheads is damaging these critical, natural, shoreline habitats. From 1993 – 2004, for example, approximately 230 miles of new, “hard” erosion protection measures were permitted in Virginia.

Equal and sometimes better shoreline protection can be achieved with the relatively new technique of “living shorelines.” An alternative to hardening, living shorelines employ natural habitat elements to protect shorelines from erosion while also providing critical habitat for wildlife and water quality benefits.

## **Why Are Living Shorelines Important?**

Living shoreline management techniques can prevent shoreline erosion while maintaining the benefits to wildlife and water quality that a natural shoreline provides. While revetments and bulkheads and other methods that “harden” the shoreline may provide property owners with erosion protection, they degrade the ability of the shoreline to provide habitat for aquatic life and to filter storm water runoff. Some of the impacts from shoreline hardening occur immediately because of shoreline structure construction, access to shoreline areas for machinery, or grading. Others are more gradual and may result from scouring and sediment re-suspension from reflected wave energy or the inability of



Photo by K. During, VIMS.

# Living Shoreline Options

A number of different shoreline management techniques can be considered living shorelines. In general, however, there are two basic options, **nonstructural and hybrid**.

Constructing a living shoreline requires trained contractors familiar with these techniques. Living shoreline construction projects may require permits from your locality or the Virginia Marine Resources Commission. To learn more about permitting requirements and to find local government contact information, visit VMRC at [www.mrc.state.va.us/regulations/hm-permits.shtm](http://www.mrc.state.va.us/regulations/hm-permits.shtm).



**Nonstructural stabilization** includes vegetation plantings (marsh grasses, submerged aquatic grasses, dune grasses), coir fiber logs or other natural materials, and beach nourishment. These techniques create a natural buffer to protect the shoreline from erosion. They can trap sediment and maintain the natural habitat features and dynamics of shorelines. Nonstructural approaches are best suited for low to moderate wave energy environments and require some ongoing maintenance. *Photo courtesy of VIMS.*



**Hybrid stabilization** techniques combine low-profile rock, rubble, or oyster/shell reefs with vegetative planting or other soft stabilization techniques such as using marsh plantings with stone containment groins; beach replenishment, segmented sills, and marsh plantings; or beach replenishment with living breakwater (low profile breakwater made with marine limestone rock set with oysters). The benefits of these options are similar to those of the nonstructural stabilization techniques, but may be used in a wider variety of habitats (typically with slightly higher wave energy). *Photo by David Burke.*

fringe marshes and beaches to migrate landward as sea level rises. Shoreline hardening can also affect the gradual movement of sediment along the shore and cause increased erosion on nearby properties. Removal of shading from shoreline vegetation can also cause shallow water temperatures to rise and oxygen to be depleted. This can adversely affect fish. Loss of trees and shrubs also reduces food and cover for birds and other wildlife.

## **Benefits from living shorelines may include:**

- Less bank erosion and property loss, especially during storms
- Lower erosion control construction costs
- Natural and visually pleasing views
- A beach for boat launching, sunbathing and swimming
- Restored marine habitat and spawning area for fish and shellfish
- Improved water quality.

Without a concerted effort to change current shoreline management practices, the trend of shoreline hardening is likely to continue as more waterfront property is developed and storms, boat wakes and sea level rise generate increasing erosion. The Virginia CZM Program, including its partner agencies and organizations, is taking steps to promote the use of living shoreline techniques and to advance related science and resource management programs.

In the end, however, it's up to individual property owners to make informed decisions about how to best manage their shorelines and the valuable resources of Virginia's coasts.

**For more information on Living Shorelines, visit the Virginia Institute of Marine Science Living Shorelines Website:**

<http://ccrm.vims.edu/livingshorelines/>

## Living Shorelines Initiative Results

- Hosted 2006 Living Shoreline Summit, which included representatives from North Carolina and Maryland.
- Developed design standards for Living Shorelines guided by new research, including a study of sill design influences on water quality and fish use, and a comparative study of nekton use of rip-rap armored and natural fringing marsh shoreline.
- Developed and offered a new training program for shoreline contractors.
- Provided Living Shorelines training workshops for local government officials (through the CBNERR Coastal Training Program) including 1) Living Shorelines: Erosion Control Alternatives and 2) Managing Impacts of Nearshore, Offshore and Shoreline Uses.
- Designed a new Living Shorelines website and new information and education materials for contractors and public and private landowners.
- Revised management policies promote the use of Living Shorelines and recognize them as the preferred alternative where appropriate.
- Inventoried 10 local shorelines, with 9 additional inventories planned within the next five years.\*
- Compiled 12 local shoreline evolution reports, with an additional 13 planned within the next five years.\*
- Development of 10 local shoreline management plans are scheduled over the next 5 years.\*

\* Va. CZM Program 2011-2015 Shoreline Strategy allocates \$720,000 for development of local plans and guidance over the next five years. Passage of Senate Bill 964 by the 2011 General Assembly requires local adoption of these plans.

For more details on Virginia CZM's role in the Virginia Living Shoreline Initiative and accomplishments:  
Shep Moon  
Virginia CZM Program  
(804) 698-4527  
shep.moon@deq.virginia.gov  
<http://www.deq.virginia.gov/Programs/CoastalZoneManagement/CZMIssuesInitiatives/LivingShore.aspx>



Photo courtesy of VIMS.



Photo courtesy of Longwood U.



Photo courtesy of NOAA.



Photo courtesy of NOAA.